UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL ADJUSTMENT ADMINISTRATION
WESTERN DIVISION
WASHINGTON, D. C.

USE AND PREPARATION OF FORM ACP-119, "NUMBER OF TENANTS AND SHARECROPPERS AND PROPORTIONATE SHARES."

Form ACP-119 has been designed for use by the county committee in determining whether there has been, during the current crop year, any attempt within the meaning of Section 8(f) of the Soil Conservation and Domestic Allotment Act, as amended, to increase the payment to the landlord or operator[1] of a farm by reducing the number of tenants or sharecroppers or by changing the leasing or cropping agreements, and if so, whether such reduction or change is justified.

A. Preparation of ACP-119

Form ACP-119 shall be prepared in the county office in connection with each farm as it is constituted in the current program year, except those farms where -

(1) neither the landlord nor operator is receiving in the current program year a larger proportionate share of any soil-depleting crop for which a payment is computed than is customary under share leases in the community; or

(2) the county committee determines, on the basis of its own personal knowledge or information obtained from the respective community committee or other persons whom it knows to be reliable, that no changes have been made between the preceding three years and the current program year, which would have the effect of increasing the payment to the landlord or operator, or such changes, if any, are so minor that the county committee would in any event consider them as being justified.

The form shall be prepared in duplicate as follows:

1. Enter the information required in the heading. The farm serial number shall be the same as the worksheet number on the report of performance for the farm; if it is a combination farm, enter the farm number also.

2. On the applicable lines of column A enter the number of tenants and sharecroppers on the farm in the preceding three years, the total number during these three years, and the average. In the event that the farm was not operated during any of the three years, enter "not operated" on the applicable line and determine the entry for line 5 by dividing the entry on line 4 by the number of years during which the farm was operated. The average should be expressed in whole numbers. Enter on line 6 the number of tenants and sharecroppers on the farm in the current crop year.

1/ The term "operator" used herein refers to a tenant who normally subleases to other tenants or who normally employs sharecroppers.

3. The remaining information in the table shall be entered separately for each crop with respect to which the landlord's or operator's share has been increased as the result of the reduction in the number of tenants or sharecroppers or as the result of changes in the leasing or operating agreements. If the entry on line 6, column A, is less than the entry on line 5, column A, entries must be made in the manner outlined below on lines 1 to 6, inclusive, of the remaining columns. However, if the entry on line 6, column A, is equal to or greater than that on line 5, column A, entries in the remaining columns will be made in the manner outlined below on lines 3 and 6 only.

   a. Where there is a landlord and information regarding the landlord's percentage share of the crop during each of the preceding three years, and the current crop year is available, enter such percentages in the spaces provided in column D and make no entries in column C. In the event that this information is not available, enter in column B the total acreage of the crop on the farm for each of the preceding three years (this information will be taken from the applicable reports of performance or applications for payment) and the current crop year. Enter in column C the landlord's acreage shares of the crop (as reported on the applicable reports of performance); and determine the percentage share for each year by dividing the entry in column C by that on the same line in column B. Determine and enter in the spaces provided in column D the total and the average of the landlord's shares of the crop during the preceding three years (unless entries are being made on lines 3 and 6 only).

   b. Where there is an operator on the farm, enter on the applicable lines in column F his percentage share in the crop during each of the preceding three years and the current crop year, if such information is available, and make no entries in column E. In the event that the operator's percentage shares are not available, enter in column B the total acreage of the crop on the farm for each of the preceding three years (this information will be taken from the applicable reports of performance or application for payment) and the current crop year; enter his acreage shares of the crop (as reported on previous reports of performance) in column E and determine the percentage share for each year by dividing the entry in column E by that on the same line in column B. Determine and enter in the spaces provided in column F the total and the average of the operator's shares of the crop during the preceding three years (unless entries are being made on lines 3 and 6 only).

4. After the above entries have been completed, the Form ACP-119 shall be referred to the county committee for a determination as to whether or not the change is justified. Where the county committee determines that any reduction in the number of tenants or sharecroppers or any change in the leasing arrangements was not justified, the original of ACP-119 must be attached to the Computation Sheet and forwarded to the State Office and the copy will be kept in the county files. Where the county committee determines that any reduction or change was justified, both the original and copy will be kept in the county unless the State Committee requests that the original be sent to the State Office.

B. County Committee's Determination

The county committee will carefully examine the information on ACP-119 and any other available data or any additional information which may be secured and determine whether any change in leasing arrangements or reduction in the number of tenants or sharecroppers is justified. If there is both a landlord and an operator on the farm, a separate determination must be made with respect to each. The committee shall carefully consider all the facts and circumstances involved, and all interested persons shall be given an opportunity to present any pertinent information for consideration. In making this determination the following factors should be taken into consideration as guides by the county and State Committees:

1. Changes or reductions made for the purpose of increasing the landlord or operator's proportionate share of the payment under the agricultural conservation or parity programs shall in all cases be found not justified.

2. The following factors are not considered in and of themselves sufficient justification for a change or reduction:

   a. The acreage allotment for a crop was smaller than the acreage normally grown on the farm.

   b. The acreage of a particular crop grown on the farm was substantially smaller than the acreage normally grown thereon.

   c. Addition of mechanical equipment which resulted in reduced labor requirements for the farm.

   d. A tenant voluntarily left the farm. The committee should consider whether or not it was possible for the landlord or operator to obtain another tenant before the leasing or cropping agreements were ordinarily consummated.

   e. A shift from one major cash crop to another major cash crop.

   f. Reduction in percentage share of a crop to a tenant when there was no corresponding change in the tenant's contribution to its production.

   g. Need for increased income to landlord or operator.

   h. The substitution of a hired man for a tenant or sharecropper.

3. Factors which might be considered in and of themselves sufficient justification for a change or reduction:

   a. A tenant or sharecropper left voluntarily and the landlord or operator was unable to secure another tenant or sharecropper after a definite effort was made to do so.

b. A direct increase in the labor contribution of the family of the landlord or operator. This might have resulted from the growing up of children, the return home of a member of the family, the marriage of a member of the family, or other similar circumstance.

c. An absentee landlord or operator moved onto the farm to operate it with the labor of his own family.

d. Voluntary abandonment of a crop by tenant or sharecropper too late for the landlord or operator to secure a satisfactory tenant or sharecropper.

e. A change in landlord or operator where the new landlord or operator normally followed a system of farming which required a smaller amount of labor than the system previously used on the farm or a different type of labor.

f. A change in landlord or operator where the new landlord or operator had a larger working force in his family than the previous landlord or operator had.

g. A tenant became a sharecropper because he was unable to continue to furnish workstock and equipment or because of other circumstances not the result of the action of the landlord or operator.

h. A neighboring farmer had been field-renting part of the farm and did not do so in the current year.

i. A share tenant or sharecropper normally worked on a farm on a share basis but bought the farm and operated it as owner.

The following points are also for the guidance of the county committee in making the determination:

1. If the entry on line 6, column D for each crop is not greater than the entry on line 5, column D for the same crop, any decrease in the number of tenants or sharecroppers may be considered justified insofar as the landlord is concerned because the landlord's share in the crop was not increased. The same principle would apply if the operator's share had not been increased.

2. If the entry on line 6, column D for each crop is not greater than the entry on line 3, column D for the same crop (in those cases where entries are made on lines 3 and 6 only), any change in the leasing agreement may be considered justified insofar as the landlord is concerned because the landlord's share in the crop was not increased. The same principle would apply if the operator's share had not been increased.

C. In any case where a payment is being reduced because of the foregoing reasons, the original copy of Form ACP-119 must accompany the related Computation Sheet to the General Accounting Office.

N. E. Dodd

Director, Western Division.

WD–25 Issued December 1940

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL ADJUSTMENT ADMINISTRATION
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INSTRUCTIONS TO FIELD RANGE EXAMINERS FOR MAKING RANGE SURVEYS

CONTENTS

These instructions outline the work and methods to be used in making range surveys for the determination of the grazing capacity of ranching units participating in the Range or Agricultural Conservation Programs.

I. PREPARATION FOR FIELD WORK

A. **Appointments.**—It is highly desirable that all range surveys be made in company with the ranch operator concerned. A routing system and schedule of examinations should be prepared and appointments made in advance to prevent lost time; secretaries of county agricultural conservation associations will ordinarily be able to assist in this. A small county map showing the approximate location of the ranch headquarters of the units to be surveyed can be used very successfully.

B. **Use of County Records.**—Before going into the field, the examiner will make sure that the ownership and control of range land as shown on the operator's current "Request for Participation" in the Range or Agricultural Conservation Program has been checked, corrected, and verified in the county office. When the information is available, the cropland should be sketched on the field map sheet showing crop acreage by fields or tracts. County records should be checked for all available surveys made by other State or Federal agencies. When the county records are not complete or current, a check with the local agencies will many times avoid duplicating acceptable work performed by other Government employees.

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C. **Use of Aerial Photography.**—When aerial photographs are available for the area to be surveyed, the fullest possible use should be made of them. The proper use of aerial photographs will eliminate tedious, expensive, and sometimes erroneous field mapping. It is a simple process to trace or copy all cultural and topographic features, range improvements, location of proposed improvements, and broad vegetative types on the field map, with an accurate determination of all field or type acreages and practice locations. The map sheets and photographs should be taken to the field where the field map can be completed by checking the data taken from the photographs and completing the vegetative type write-up for each type or subtype. There are two types of pictures available at the Western Division Laboratory at Salt Lake that are recommended for use when making range surveys: (1) The contact prints developed on a 2-inch-to-the-mile scale, using 4½ x 7½-inch cards. This size can be conveniently filed and readily used in the field with little or no damage to the print. Each print shows approximately six sections of land. (2) Uncontrolled Mosaic prints show a complete township on each picture reduced to a 2-inch-to-the-mile scale. These Mosaics may be used to replace the master range map prepared on Form WD–3.

D. **Equipment and Supplies.**—The range examiner will be furnished with the necessary equipment and supplies before beginning the actual field work. Necessary equipment shall include the following: Carrying case, spring-back binder, 20–40 scale rule (preferably a flat 6-inch boxwood), compass, and protractor. It is very desirable to include a hand level, 100-foot measuring tape, water canteen, and tally register. Necessary supplies shall include: Proper forage use tables (showing the forage values for each class of livestock and standard symbols for all important forage plants), range survey field sheets (Form WD–8), mapping sheets (8 x 8 graph paper and current map forms), paper, pencils, signed "Request for Participation," county map (showing routing schedule), and a complete set of all State bulletins, instructions, practice specifications, and applicable forms.

The forage acre requirement will be furnished by the State office for all counties in which range examinations will be made.

II. PROCEDURE IN THE FIELD

A. **Outline of Field Work.**—1. All ranching units should be examined in company with the ranch operator or his representative. If the operator cannot assist with the completion of the examination of the entire unit, every effort should be made to inspect in company with the operator the areas and locations where the range improvements are needed. While doing this explain and analyze as much as possible the grazing survey work as it is applied to his ranching unit.

2. Before undertaking a detailed examination of the ranching unit or any part thereof, a preliminary examination should be made for the purpose of determining generally the extent and uniformity of types, the general topographic features, and other information pertaining to the ranch. This preliminary look at the country together with the use of aerial photographs when available will assist

the examiner in developing the most practical system of examination. The preliminary examination is necessary because the work required in the subsequent and more detailed survey will depend upon the frequency and extent of the types and subtypes, as well as upon the topography of the ranching unit and similar factors.

3. Use the terminology and units of measurement exactly as they appear in the current State handbook.

4. The range land in the ranching unit will be examined by the range examiner as quickly and thoroughly as possible in the following manner: Map the improvements and culture, using standard symbols; check the cropland, making any corrections on the map that are found to be necessary; map the types and determine the grazing capacity of the range land, completing the field map as the examination proceeds; show separately and as accurately as possible the acreage of range land, mountain meadowland, and cropland, using either General Land Office survey data, county assessor's records, or the planimeter acreage of aerial photographs. When calculating the range acreage on large ranches, determine first the total acreage of the unit then deduct the measured acreages of all cropland, mountain meadowland, farmsteads, roads, waste, etc.

5. Before leaving the ranch the grazing capacity figure will be calculated; all practices needed on the ranching unit will be shown in the proper location on the map; and all practices and specifications of practices to be performed for payment, grazing surveys, and other pertinent facts concerning the ranching unit will be discussed in detail with the operator, making sure that he has a clear conception of all phases of the program.

6. All range survey data recorded by the examiner will be entered by him on the proper township plat, Form WD–3 or similar form, in the County Range Atlas.

7. All records of field examinations and other pertinent data should be turned over to the county committee as soon as they are completed.

III. GRAZING SURVEY INSTRUCTIONS

A. **Method.**—The RECONNAISSANCE (or OCULAR) method of making range surveys will be used throughout the Western Region. Under this method, the examiner goes over each section or enclosure in enough detail to see all representative portions of it; he determines what types are included; he then writes up each type separately after making careful ocular estimates of (1) the density of vegetation on the ground, which is the portion of the ground covered by such vegetation; and (2) the composition of the vegetation, which is recorded in terms of the percentage which each class—grass, weeds, or shrubs—is of the total. All of the important species are also listed and the percentage which each species makes up of the total is entered. Type write-up sheets should be completed while working each type. Form WD–8 will be used for recording the field examination data.

B. **Density.**—In estimating density, the spread of the vegetation above the ground must be carefully considered. The density of weeds of more or less upright growth should be based on the amount of ground that appears covered when the vegetation is viewed from

directly above. In estimating the density of spreading weeds, or browse, or open clumps of grass, the forage should be lightly pressed together, or raised at an angle, so that all of the normal interstices between the leaves are completely filled without compressing or unnaturally crowding the vegetation. The forage is then so compacted that it will represent a practically full coverage of the ground, or 10/10 density. Density for each species should be based on the appearance of the plants when they have attained their full normal growth in a normal year in an ungrazed condition. Since estimates are made at all seasons of the year and under conditions of drought or of abnormal moisture and growth, it is essential that the estimator make due allowance for one or all of the following conditions: (1) For growth still to be attained; (2) for portions already eaten; (3) for abnormal total forage production; (4) for drought; and (5) for any other abnormal factor. The density of browse should be determined by the portion of the ground covered by that part of the browse which is accessible to livestock and from the current year's growth only. This would exclude from the estimate the inaccessible interior of dense clumps; likewise any oak or other brush that forms an upper story beyond the reach of livestock should not enter into the density estimates. In estimating availability for different classes of livestock, shrubby vegetation within 30 inches from the ground may be considered as available for sheep; shrubby vegetation within 60 inches from the ground may be considered available for cattle. Where a double story of vegetation exists such as browse over grass, judge the density of each story separately. Both stories are included in the final density estimate. It must be emphasized that the estimates of density should represent a true average for the type as a whole. Special attention should be given to this in the case of composite types which cannot be divided into separate type units.

It is very helpful in estimating density of a type to stop occasionally and confine the estimate to a square plot of ground of convenient size depending on the type. It is much easier to come to a conclusion as to density and composition on a small plot that can be easily studied than to attempt to make the final estimate for the whole type without this aid. The examiner, as he goes through the type, should jot down notes on density and composition changes together with the approximate acreage to which they apply. Before he leaves the type, he should average the figures he has recorded and use them as an aid to estimating the final average density for the type as a whole.

As an aid to obtaining uniformity in density estimates, it is well after the percent of vegetative cover has been estimated in turn to estimate the percent of bare ground. For example, an examiner estimates that the vegetative cover has a density of 35 percent. He then estimates the percent of bare ground on the same area as a separate mental process. Obviously, unless his estimate of bare ground on this area is 65 percent, he is in error and further scrutiny of the vegetation and bare ground is needed until the sum of his two percentage estimates equals 100.

If the examiner has difficulty in arriving at density and composition estimates, it is well to make a physical check in types which

adapt themselves to it. This can be done by marking off on the ground a square plot of convenient size, depending on the type. The grass sod and other available vegetation is then cut an inch or so under the surface and it is placed compactly together to form full coverage (10/10 density). The percentage of the plot covered can be ascertained and composition may be checked in the same operation.

Gravel river beds, shifting sand dunes, recent lava flows, alkaline lake beds, bare rock surfaces, and heavily timbered areas, producing insufficient vegetation to make their uses practicable and other unproductive or unusable spots if they occur in small acreages, may be considered in estimating density by lowering the density of the type in which they occur enough to take care of them. If these nonforage producing areas occur in large acreages and can be mapped out, then they should be eliminated as wasteland and not used in computing the RANGE-BUILDING ALLOWANCE.

C. **Proper Forage Use Factor.**—Proper use factor (or palatability), as used in range surveys, is the maximum percent of the total current year's growth within reach of stock to which a species may be grazed when the range unit is properly utilized under the best practical range management. The proper use tables used are the standard tables now used by all State and Federal agencies concerned with the establishment of grazing capacities. These tables show the proper forage use for each species in percent, and indicate the symbol for each species.

D. **Composition.**—Type composition estimates are based on the the relative density abundance of each available vegetative species in the type. The examiner should, after making sure that he has seen a fair example of the total type area, prepare this portion of the write-up while still in a representative part of the range type. Type composition will be itemized on Form WD–8 and expressed in terms of percentage. In determining composition, the examiner should rate each species according to the abundance of the individual species in relation to the total cover. The sum of the percentage figures for all vegetative species shall equal 100. It is generally desirable to show the estimate of composition by listing the species in the order of their abundance in the type, starting first with the species which composes the greatest percentage and rating each lesser species in the proper order. Such a rating scheme results in a definite expression of relative abundance. Afterward, the individual initial ratings may all be slightly adjusted to total 100 percent without destroying the estimated ratio. Individual vegetative species, representing less than 1 percent of the total type composition, should be indicated as a trace on the type write-up sheet or grouped with other comparable species. The use of one-fourth or one-half of 1 percent involves a lot of unnecessary mathematical computations that carry no appreciable weight in the final answer.

E. **Field Computation.**—After the composition rating for each individual species has been recorded on Form WD–8, that rating is multiplied by the proper use figure for the species, and the sum of all the individual products yields the weighted average proper forage use for the type. This weighted average figure multiplied by the estimated density provides the forage acre factor for the type.

The forage acre factor multiplied by the number of surface acres gives the number of forage acres in the type.

F. **Forage Acre Requirement.**—The forage acre requirement is a very important element of range surveys; it represents the number of forage acres necessary to provide feed for one animal for one month. The development of a forage acre requirement figure will be one of the first duties of the STATE RANGE EXAMINER so that it will be available for use of the field range examiners. To do this, select two or more ranching units in the locality which will total at least 25,000 acres but preferably 50,000 or more, on which the following conditions prevail: (1) Vegetative ground cover should show that the lands have not been overgrazed during a past period of at least 10 years, that the density and normal vigor of the plant growth has been maintained, that there has not been active erosion or loss of top soil, and that there has not been an encroachment of unpalatable vegetation; where such conditions prevail, it may be assumed that these lands have been properly stocked. (2) There must be complete and accurate records or other reliable means of ascertaining the numbers of stock and periods grazed on the lands during each of the past ten or more years so that the average number of animal-months it has carried through the entire period, which would include good and bad years, may be accurately determined. A regular range survey will then be made, using exactly the same method as is adopted for other land in the locality; and using special care to estimate densities and composition as accurately as possible, and on the same relative basis that is to be used for other survey work to which it is related. From this survey the number of forage acres will be determined; then, the figure representing this will be divided by the AVERAGE number of animal-months per year which have been grazed on the ranching unit during the past period of years. The result will be the forage acre requirement figure. If the steps above outlined have been carefully followed, this will give a correct LOCALIZED forage acre requirement for the current grazing season.

In each State there are distinctly different types of range lands, with greatly varying rainfall, elevations, and growing seasons, and in most of them it will be necessary to develop different forage acre requirement figures for different parts of the State. In such cases there should only be broad general divisions. It will be satisfactory to use the same base areas as were used in previous years for developing the forage acre requirement but they should be checked each year by a complete new range survey; and, where possible, other suitable base areas should be added because larger acreages will obviously furnish more reliable averages. The importance of extreme care in selection of base areas, in determining the number of stock they have carried and in making surveys of them cannot be overemphasized. The forage acre requirement will, when properly applied, reflect the normal stocking rate of a given area. For this reason, forage acre requirement studies must be made each year to properly level off current fluctuations in vegetative growth. Requirement figures developed during the current year MUST NOT be used for adjusting or correcting range surveys of previous seasons.

G. **Supplemental Data.**—On Form WD–8 be sure to enter: (1) The State and county code and ranch serial numbers; (2) the name of the operator; (3) the name of the examiner; (4) "type," meaning vegetative type; (5) average density; (6) average proper use factor; and (7) forage acre factor. This information should be filled in at the conclusion of the field examination from the calculations resulting from the type write-up; (8) indicate whether for cattle and horses (C. & H.) or for sheep and goats (S. & G.); (9) date means the date the field examination was made, not the date the application was filed or completed; (10) locations should be given by section, township, and range; (11) field sheet number refers to the number of the write-up; for example, if five types were mapped on a ranch, there would be five write-ups numbered from 1 to 5; and (12) the grazing capacity entries are self-explanatory.

On the back of Form WD–8, the conditions applicable to the land examined should be checked under the several captions. This will provide a ready means for recording essential data on watering facilities, degree of utilization, condition of range and forage, class of stock, proper seasonal use, distribution of stock, methods of handling, rodents, poisonous plants, range improvements, desirable range-building practices, and other data.

A sample Form WD–8, illustrating the proper manner of completion is included at the end of these instructions.

All grazing capacities, range-building practices, and other pertinent data will be summarized on the current program form used to report these data to the county committee.

IV. PREPARATION OF MAPS

A. **Field Maps.**—The current map form will be used for smaller ranches; for large ranches, rolled cross-section mapping paper should be used. It is preferable, where practicable, to include an entire ranching unit on one map sheet. Ordinarily it is best to use a 2-inch-to-the-mile scale so there will be ample room to show improvements and practices. Indicate on every map the SCALE, DATE, and NAME OF INDIVIDUAL WHO PREPARED IT. The following data should be obtained by the examiner and recorded on the field map sheets:

1. **Forage types.**—The limits of each type should be shown on the map by light dotted lines. Mapping types of less than 10 acres are not required unless they are meadows or other areas of high grazing capacity. It may be difficult in surveying small types of high grazing capacity to show all of the irregularities of the type line. The principal point to be observed in these cases is that of getting the acreage approximately correct.
2. **Fences, watering facilities, and drainage.**—All fences, watering places, and drainage should be shown. Special attention should be given to the accurate placing of these items as they often are a controlling factor in range management and the consideration of practices; they are especially important in connection with deferred grazing.
3. **Other culture.**—Buildings, corrals, roads, trails, telephone lines, cultural features, and all completed or recommended practices should be shown in their proper location by the standard symbol.

B. **Master Range Map.**—The rough field map will be made by the examiner on the current map form. Instead of dressing up this map or making a copy of it on another form, the examiner will transfer the map data from the rough field map to the proper township

plat of the master range map. The final and completed map of the ranching unit will then be a part of the master range map. The county master range map should be made on township sheets, Form WD–3 or a similar one, on a 2-inch-to-the-mile scale. The sheets should be assembled in an atlas-type binder.

Standard symbols will be used in mapping. Refer to the legend attached to these instructions. Black India ink should be used for all entries on the maps except:

1. The boundary of the ranching unit.
2. The identification or key number of the operator.
3. All proposed and completed practices not of a permanent nature such as deferred grazing, fireguards, etc.

Data to be included on the map are as follows:

1. **Grazing survey data:** a. FORAGE TYPES.—Indicate vegetative types on the map by the proper type number followed by standard symbols to indicate the dominant species. Symbols for all species of herbaceous vegetation are indicated on the proper use (or palatability) tables and should be used to designate the types. The limits of each type should be shown by light dotted lines.

b. GRAZING CAPACITY.—The grazing capacity of a ranching unit is the sum of the grazing capacities of the individual types. The grazing capacity of a type, in animal months, is obtained by multiplying the surface acres in that type by its forage acre factor and dividing the result by the forage acre requirement. Grazing capacity should be shown on the map by types by sections and should be written as a fraction with the surface acres as the numerator and the animal months as the denominator. For example: The figure $\frac{297}{105}$ would indicate there are 297 surface acres of a specific type with a grazing capacity of 105 animal months.

2. **Cultural features:** a. Standard symbols should be used in showing roads, streams, buildings, and cultural features on the map.

3. **Proposed and completed improvements:** a. All proposed and completed improvements of a permanent nature should be shown on the map according to the standard legend. All completed permanent improvements for which payment has been made under the range program should be encircled with red ink or a red pencil and the program year entered inside the circle.

4. **Use of an overlay map:** a. An overlay map, using a medium grade tracing paper, may be placed in the range atlas over the township sheet. All practices or improvements not of a permanent nature, such as deferred grazing, fireguards, rodent control, etc.; the exterior boundary lines of the surveyed ranching unit; and the operator's name or identification number should be recorded on the overlay. The use of an overlay map permits current map entries of all program operations without ruining the original township plats.

5. **Other data:** a. LEGEND.—A list of standard legend symbols should be attached to the inside of the front atlas cover.

b. INDEX OF OPERATORS.—The first sheet in the binder should be an index giving the names of all of the operators in the program with their key numbers and the pages of the atlas on which their land is mapped. For example:

20. John Doe—Page 6–7.
21. Wm. Smith—Page 7–9.

c. MAP SHEET.—Use only the front side of the map sheet. Enter at top the township and range numbers.

V. CLASSIFICATION OF FORAGE TYPES

A. **Type Designations.**—Types will be indicated on the map by the proper type number followed by standard symbols to indicate the dominant species. Types containing a timber overstory will carry the principal timber species symbol after the type numbers. The governing rule should be that the number and symbols will give an accurate picture of the principal species.

Types will be designated according to aspect. For instance, if the type is predominantly a grass type with scattering timber, it will be shown as a 1 type, followed by the timber symbol. The conspicuous or most important species or genus symbol will be shown first, followed by minor species. Unless exceptional conditions prevail, not more than three symbols will be shown in a designation. If less than three species are prominent, the number of symbols should be reduced accordingly; ordinarily two will be sufficient.

B. **Color Legend.**—Standard colors are shown for each type by "Mongol" crayon guide numbers.

The use of crayons contemplates a medium-light application of crayon, smoothed out through the use of an art finger dipped in gasoline. Use of color legend is not mandatory and may be omitted from maps where symbols are used.

C. **Symbols.**—Symbols for all species of herbaceous vegetation are indicated on the proper forage use tables and should be used to designate the types and subtypes.

D. **Type Descriptions.—**

SHORT GRASS [1 S] (*light yellow—Mongol 817*): Includes grassland other than meadows. Perennial grasses predominate and determine the aspect, although weeds and browse may be present. Example: Grama-buffalo grass.

TALL GRASS [1 T] (*dark yellow—Mongol 867*): Examples of types are: Bunch grass, wheatgrass-sedge, alpine grassland, and blue stem.

WET MEADOW OR MARSH [2 W] (*cadmium orange—Mongol 862*): Wet meadows are characterized principally by sedges, rushes, or moisture-enduring grasses that remain wet or moist throughout the summer.

DRY MEADOW OR FLOOD PLAIN [2 D] (*cadmium orange—Mongol 862*): Dry meadows are dominated by grasses rather than sedges and occur as moist meadowlike areas in open timber or intermittent meadows, both of which become moderately dry by midsummer.

NATIVE HAY MEADOW [2 H] (*cadmium orange—Mongol 862*): This type includes all native grassland normally cut for hay. Areas classified as mountain meadowland will be designated by this type description with ONLY the field acreage recorded within the type. Areas cut for hay that are not classified as mountain meadowland will have a surveyed grazing capacity established with the type acreage and animal month grazing capacity shown in the usual manner.

PERENNIAL WEEDS (not desert weeds) [3] (*lake red—Mongol 866*): Includes all untimbered areas where perennial weeds predominate over other classes of vegetation. Except on "go-back" lands, there is very little true weed type, as a weed cover is usually more or less temporary in character and is soon replaced by a more permanent type if the disturbing factor is removed. If there is no great predominance of the weeds over the grass or brush vegetation, and if it is possible to judge that the weed predominance is due to some unnatural factor, the weeds should be disregarded in designating the type and the more stable vegetation should be used as an index. The weeds will then be indicated as a subtype.

SAGEBRUSH [4] (*stone brown—Mongol 893*): This type includes all untimbered lands where sagebrush species predominate. Areas dominated by shrubby species of sagebrush usually include big sagebrush (*Artemisia tridentata*), three-tip sagebrush (*Artemisia tripartita*), silver sage (*Artemisia cana*), sandsage (*Artemisia filifolia*), black sage (*Artemisia nova*), and budsage (*Artemisia spinescens*). Sagebrush lands are usually different in range values and grazing season from the areas which are generally classed as browse. Sagebrush like all other types will be typed by aspect, subtyping the major forage species associated with sagebrush. Large areas having a predominant aspect of rabbit brush (*Chrysothamnus*) will be considered a browse type. Small areas of rabbit brush intermingled with broad sagebrush types will be included in the sagebrush type, subtyping the rabbit brush to indicate its presence.

BROWSE-SHRUB [5] (*olive green—Mongol 888*): This type includes all untimbered lands where browse, except sagebrush or its subtypes, gives the main

aspect to the type or is the predominant vegetation. Characteristically it occupies the transition zone of the lower mountain slopes, foothill, and plateau areas. Examples of subtypes are mountain mahogany, bitter brush, willows, Ceanothus, etc.

CONIFER [6] (*dark green—Mongol 858*): This type includes all range in coniferous timber supporting grasses, weeds, browse, either singly or in combination, except as provided under Types 7 and 9. The forage may vary from a pure stand of pine grass, or some other grass, to a pure stand of weeds or browse. It usually, however, consists of grasses, weeds, and browse, and the proportion of each species varies so widely that it is not thought advisable to attempt a division into types with distinct colors. These variations can best be represented by subtypes.

WASTE [7] (*blue-green—Mongol 898*): This type includes all areas of dense timber and brush which have no value for grazing or have such slight value that they cannot be used economically, owing either to denseness of standing or down timber or sparseness of forage growth. Large areas of very sparse forage, unless within easy reach of a better type, shall be classified as waste because of the impracticability of running stock over so large an area to get such a small amount of feed.

This type also includes other waste areas not strictly in timber or brush and not barren which are so rough or inaccessible as to make their future use improbable.

The subtype designation generally encountered in this type are as follows (principal species of timber should be shown by symbols):

Waste in dense timber [7 T]
Waste in down timber [7 D]
Waste in brush [7 B]
Waste areas where rocky character prevents use [7 R]
Permanently inaccessible areas [7 I]

BARREN [8] (*Blank*): This type includes all areas on which there is naturally no vegetation, or practically none, including intermittent lake beds, saline flats, active sand dunes, shale, rock slides, lava flows, etc. Areas which have been denuded by overgrazing should not be confused with areas naturally barren, nor should areas containing only annuals for a part of the year be shown under 8, although these may be without vegetation for the remainder of the year.

PINON-JUNIPER [9] (*light green—Mongol 848*): This type includes pinon, juniper, pinon-juniper, and digger pine. The character of the range in this type as regards location, grazing capacity, and management is sufficiently distinct from the conifer type to justify a separate color. The forage may vary from a pure stand of grasses, weeds, or browse to a combination of any two or all. This variation can best be shown by subtype designations.

BROAD-LEAF TREES [10] (*pink—Mongol 846*): This type includes all range in deciduous timber. The combination of grasses, weeds, and browse, and the proportion of individual species, will vary as in other types. The principal types which will be encountered are: aspen, cottonwood, oak, birch, alder, ash-elm, etc., when they occur in tree form.

CREOSOTE [11] (*bottle green—Mongol 855*): This type includes areas where creosote bush (*Covillea*) constitutes the predominant vegetation.

MESQUITE [12] (*yellow earth—Mongol 853*): This type includes areas where various species of the mesquite (*Prosopis*) give the characteristic aspect or constitute the predominant vegetation.

SALTBUSH [13] (*slate—Mongol 819*): This type includes areas where the various salt desert shrubs of the *Atriplex* genus form the predominant vegetation, or give the characteristic aspect. There is sufficient significant difference in the range value and the use of saltbush areas to justify their separation from other desert or semi-desert shrub types.

GREASEWOOD [14] (*royal purple—Mongol 864*): This type includes areas where greasewood (*Sarcobatus*) is the predominant vegetation or gives a characteristic aspect. Characteristically this type occupies valley floors subject to overflow during flood periods or areas underlain with groundwater at shallow depths where the soil is more or less saline. It is sufficiently differentiated from other desert shrubs to justify a separate type.

WINTERFAT [15] (*light tan—Mongol 813*): This type includes areas where winterfat (*Eurotia*) gives a characteristic aspect or constitutes the predominant vegetation. Though commonly associated with other semidesert shrubs, the occurrence of this plant in Utah and Nevada as a type character is of sufficient extent to justify a separate type.

DESERT SHRUB [16] (*dark tan—Mongol 863*): This is a general type which includes areas where other desert shrubs aside from those separated into individual types, constitute the predominant vegetation or give the characteristic aspect. This type includes several genera which are quite distinctive in type habit such as black brush (*Coleogyne*), coffee berry (*Simmondsia*), cat claw (*Acacia, Mimosa*), gray molly (*Kochia*), hopsage (*Grayia spinosa*), spiny horsebrush (*Tetradymia spinescens*), and little rabbit brush (*Chrysothamnus stenophyllus*), but pure types of each are so limited in extent as to not justify separate types. The plant symbols used will be sufficient to indicate the predominant species present.

HALF SHRUB [17] (*wisteria—Mongol 844*): This type includes areas where half shrubs constitute the dominant vegetation or give the characteristic aspect. Half shrubs are semi-woody perennials of low stature such as (*Aplopappus*), (*Gutierrezia*), (*Artemisia frigida*), (*Eriogonum wrightii*), etc. They commonly consist of a wood caudex from which herbaceous stems are produced that die back annually. These genera are sufficiently distinctive in habitat and of wide enough extent in certain localities to justify a separate type designation.

ANNUALS (weeds or grasses) [18] (*red terra cotta—Mongol 876*): This type includes areas in which annual weeds or annual grasses constitute the dominant vegetation. Both transitory stages and semi-permanent conditions should be included in this type as for example: Russian thistle, downy chess (*Bromus tectorum*), desert weeds. The plant symbols used will be sufficient to indicate the predominant species present.

ABANDONED CROPLAND.—Abandoned cropland should be classified according to aspect. Restoration land that has been reclassified as range or pasture land will be typed as abandoned cropland. In mapping, the areas should be shown by the standard legend symbol (horizontal lines).

CROPLAND.—In mapping, the field boundary will be cross-hachured, leaving the center of the field blank for acreage entries.

VI. GLOSSARY

VEGETATION—Any plant life on the range which is available to livestock.

RANGE FORAGE—Any range vegetation which has a value as feed for livestock.

VOLUME—The amount of forage produced on a given area during any year.

FORAGE TYPE—An area of range land where a single plant or group of similar plants gives a characteristic aspect to the landscape.

DENSITY [D.]—That portion of ground surface covered by a vertical projection of the plants expressed in tenths of complete cover.

PROPER USE FACTOR [P.U.F.]—The average degree to which a plant is taken by stock, when the range as a whole is properly grazed. The difference between this figure and 100 percent will give the percentage which should be left on the ground. Any one kind of forage will vary in value due to such factors as season of use, relative abundance, class of stock, selectivity, etc.

FORAGE ACRE FACTOR [F.A.F.]—The numerical figure which indicates the number of forage acres in each surface acre. It is used in computing forage acres and is obtained by multiplying the sum of the proper use factors of a type by its density.

Formula: Density×proper use factor=forage acre factor.

FORAGE ACRE [F.A.]—An acre of land completely covered by a stand of forage, all of which can safely be grazed by livestock. The nearest approach to this under actual conditions is an acre of thick lawn. The density of such an acre would be considered as being a ten-tenths or complete density. Theoretically, if all the fully palatable forage of a section of land were crowded over onto one corner in a $^{1}/_{10}$ density, the number of acres covered would be forage acres. A forage acre is the unit of measurement of the forage resources of a range.

Formula: Forage acre factor×surface acres=forage acres.

SURFACE ACRE—An acre of land as surveyed on the ground by horizontal measurement. (Its area is 10 square chains.)

ANIMAL MONTH [A.M.]—One month's feed for one animal unit.

Formula: Forage acres÷forage acre requirement=animal months.

ANIMAL UNIT [A.U.]—One cow, one horse, five sheep, or five goats or the equivalent thereof. (Animal units of grazing capacity as used in A. A. A. procedure refer to the amount of forage required to feed one animal unit for 12 months.)

GRAZING CAPACITY [G.C.]—The number of animal units which any range will support on a sustained yield basis.

Formula: Total animal months÷12 months=grazing capacity (in terms of animal units).

FORAGE ACRE REQUIREMENT [F.A.R.]—The number of forage acres necessary to provide feed for one head of stock for one month under average growing conditions. For a 12-month season the allowance for one month is multiplied by twelve. Forage acre requirements are based on animals over six months of age.

SUSTAINED YIELD—Sustained yield represents the annual production of forage that may be grazed without causing a change in forage composition, loss of plant vigor, or soil deterioration.

UTILIZATION—The amount of annual forage consumed by livestock.

PROPER UTILIZATION—The average percentage of the annual forage crop which may be consumed by livestock without damage to the range.

OVERUTILIZATION (OVERGRAZING)—The use of more than 75 to 80 percent of the forage crop.

Form WD-8
U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL ADJUSTMENT ADMINISTRATION
Western Division

State Wyo. County Gallatin

83-009-1-20
(Code and ranch serial number)

RANGE SURVEY FIELD SHEET

(Reconnaissance Method)

Ranching unit John Doe
Examiner Wm. Smith
Type 1 Bte
Avg. density 4 Avg. Pal. 299
F. A. factor .120 For C + H
(C. and H. or S. and G.)

Date March 28, 1941
Location Sec 15, T8N, R6E
Field sheet No. 4

Grazing Capacity: F. A. factor .120 × 160 Surface acres = 19.2
Forage acres ÷ Forage acre allowance .6 = 32
Animal months ÷ 12 = 2.67 Animal units.

TYPE WRITEUP

PRINCIPAL VEGETATION SPECIES

GRASSES, 50 %	% EACH SPEC.	% PALATABLE	WEIGHT PALATABLE	WEEDS, 49 %	% EACH SPEC.	% PALATABLE	WEIGHT PALATABLE	BROWSE, 1 %	% EACH SPEC.	% PALATABLE	WEIGHT PALATABLE
Bte	30	20	.060	Spe	27	20	.054	Cll	1	10	.001
Poa	15	50	.075	Eci	8	80	.064	Atr		–	–
Shy	5	40	.020	Ala	7	20	.014				.001
			.155	Bsa	4	20	.008				
			.143	Eri	3	10	.003				
			.001				.143				
			.299								

COMMENTS

Current forage utilization: (check one) Over ☐ Proper ☑ Under ☐
Plant vigor: (check one) Poor ☐ Fair ☑ Good ☐
Range condition: (check one) Poor ☑ Fair ☐ Good ☐
Relative productiveness of site: (check one) Low ☐ Average ☐ High ☑

Watering places Well (Kind: Lake, spring, tank, etc.) 1/2 mile (Distance) Permanent (Permanent, temporary)

Kind of stock on range: (check one or more) Cattle ☑ Horses ☑ Sheep ☐ Goats ☐
Proper grazing period: (check one or more) Spring ☑ Summer ☐ Fall-winter ☑ Year long ☐

Wildlife Few deer Medium infestation ground squirrel (Game, predators, rodents (species and abundance))

Soil erosion: Sheet erosion evident None
Gully erosion:
Occasional gullies: (check one) Shallow ☐ Medium ☐ Deep ☐ Heavy ☐
Frequent gullies: (check one) Shallow ☐ Deep ☐

Wind erosion: Deposition evident None Removal evident None

(Explanation of gully terms: Occasional gullies are gullies more than 100 feet apart. Frequent gullies are gullies less than 100 feet apart. Shallow gullies are those easily crossable by stock. Deep gullies are those deep enough to interfere with stock movements.)

RECOMMENDATIONS ON PRACTICES
(Indicate location and extent)

(a) Natural reseeding by deferred grazing None

(b) Artificial reseeding Entire type, 160A. NE¼ Sec. 15, T8N, R6E, - See Remarks

(d) Contour listing, furrowing, or subsoiling Contour listing of entire type - Will Aid seeding

(f) Spreader dams and terraces None

What additional water developments are needed to insure proper utilization? Location and type recommended

Elimination of destructive plants None

(l) Fire guards None

Other practices and improvements Temporary fence should be put around (Fences, adjusted stocking, rodent control, poisonous-plant control) entire field until new seedings are sufficiently established to withstand grazing.

REMARKS: For fall and winter grazing perennials are of more value than annuals. Reseed area by drilling in fall with 6 to 8 # mixture of crested wheat and slender wheat grass.

March 28, 1941 (Date) Wm. Smith (Range examiner)

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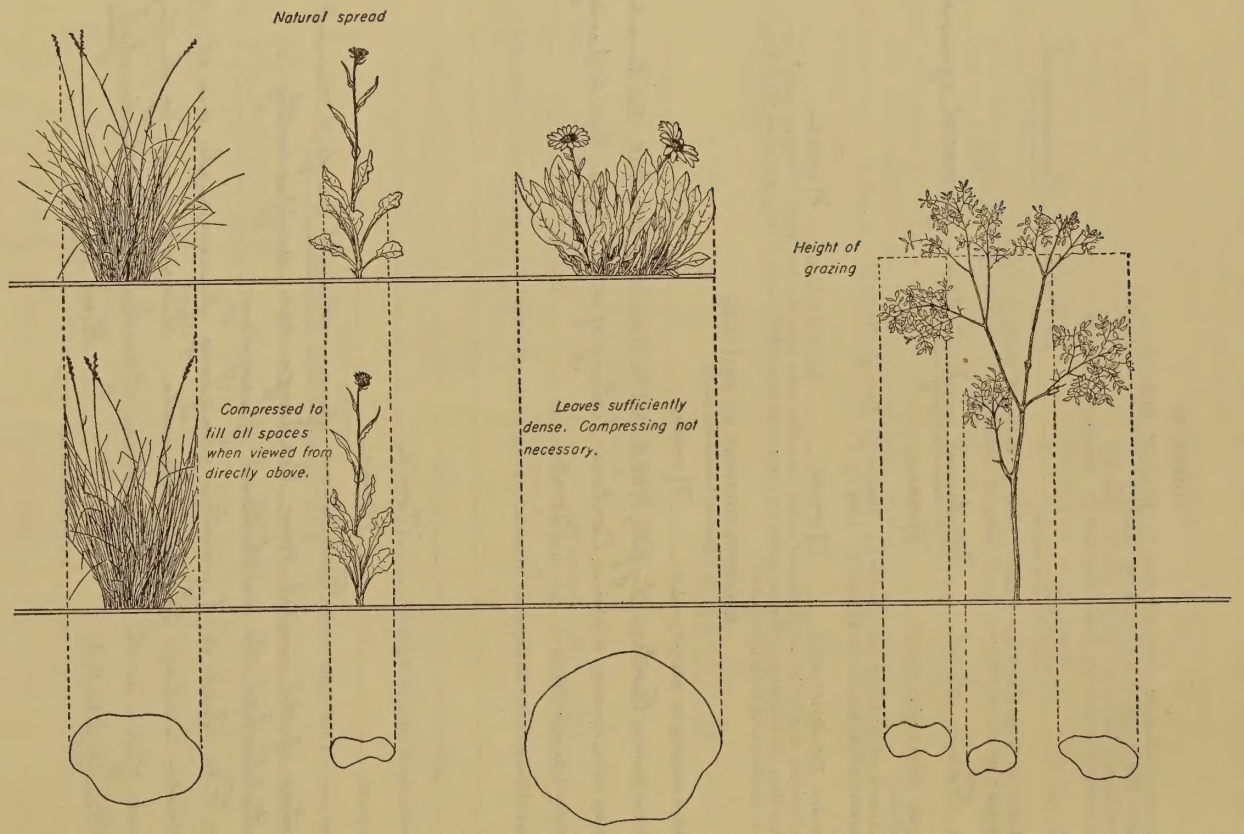
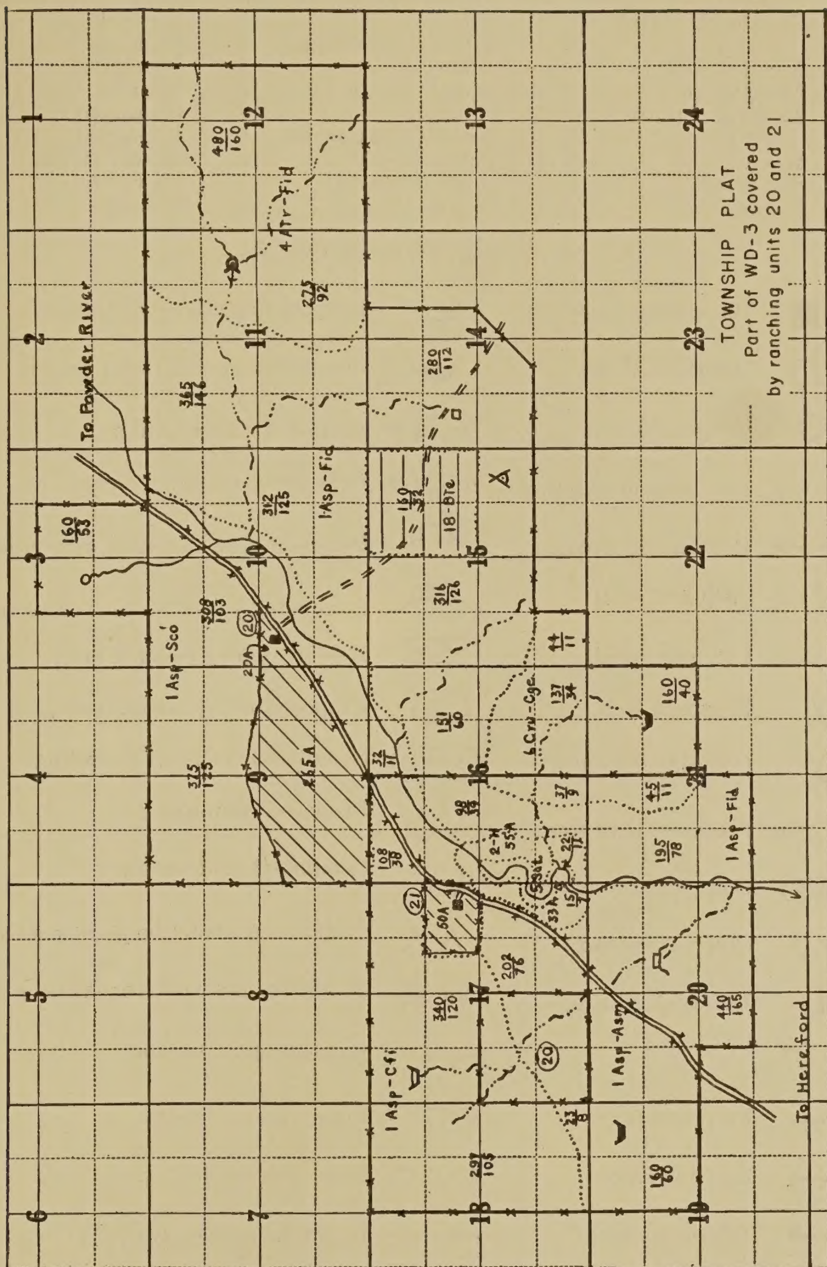


RECONNAISSANCE DENSITY: Shows method of judging reconnaissance densities for grass, weeds, and browse.

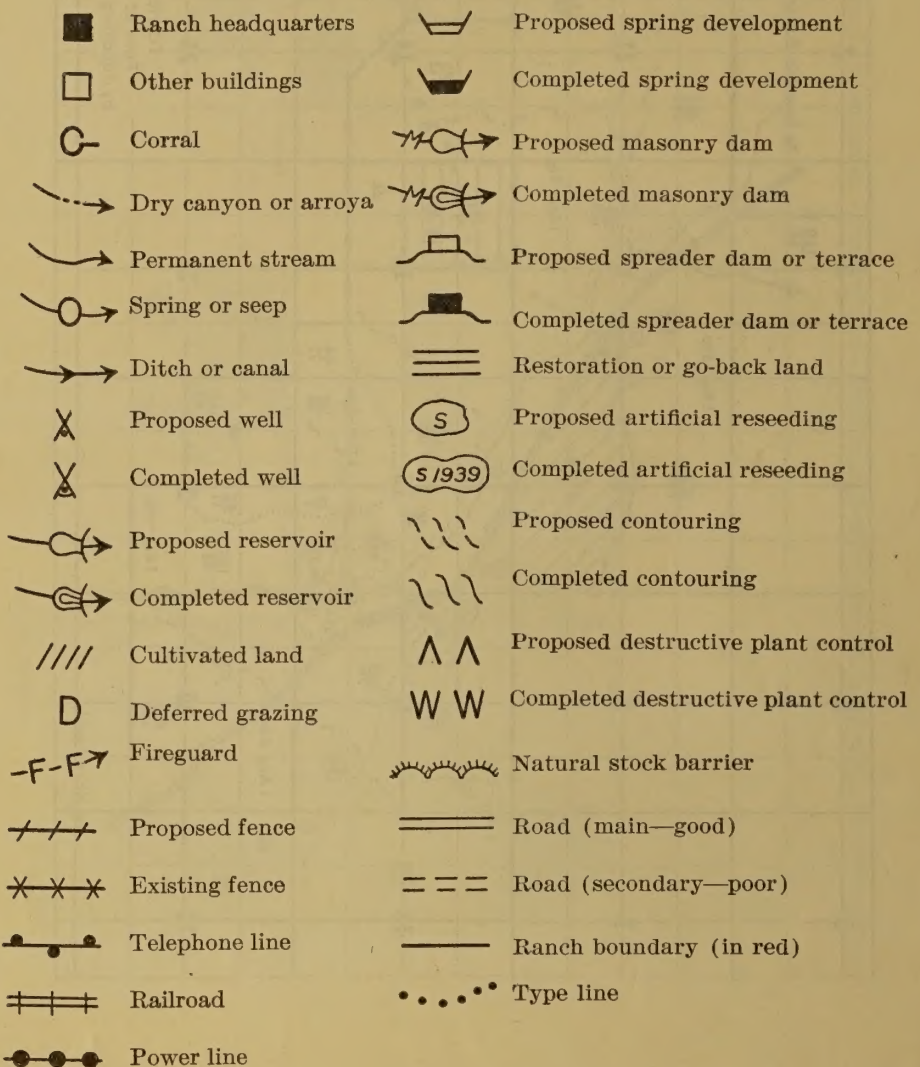

TOWNSHIP PLAT
Part of WD-3 covered
by ranching units 20 and 21
To Powder River
To Hereford
1 Asp-Sco
1 Asp-Fid
4 ATr-Fid
18-BTe
6 Crw-Cge
1 Asp-Cfi
1 Asp-Asp

RANGE SURVEYS—MAP LEGEND SYMBOLS

RANGE TYPES

1 S	Grassland (short grass)	6	Timber (with feed)	9	Pinon-juniper
1 T	Grassland (tall grass)	7 T	Dense timber (no feed)	10	Aspen or cottonwood
2 W	Meadow (wet)	7 D	Waste (down timber)	11	Creosote
2 D	Meadow (dry)	7 B	Waste (dense brush)	12	Mesquite
2 H	Meadow (native hay)	7 R	Waste (rocky areas)	13	Saltbush
3	Weed	7 I	Permanently inaccessible areas	14	Greasewood
4	Sagebrush	8	Barren	15	Winterfat
5	Browse			16	Desert shrub
				17	Half shrub
				18	Annuals

CULTURE AND PRACTICES



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